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SUPPLEMENTARY DESCRIPTIONS OF TWO MYODOCOPID OSTRACODS FROM THE RED SEA

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This study is based on ostracods collected on the *Pola* Expedition to the Red Sea in 1896 and described by Dr. Herbert Graf (1931). In the original description of *Philomedes polae* (=*Euphilomedes polae*), Graf (1931) did not designate a holotype and omitted some details of carapace and appendage morphology. Graf's description may have been based on more than one species. The species, therefore, is redescribed herein and a lectotype selected from the available type-series. Specimens designated as *Philomedes* species by Graf (1931) have been identified as females of *E. polae* and are described as such. A single specimen included by Graf in the type-series of *Philomedes polae* has been identified as *Euphilomedes arostrata* Kornicker (1967); this identification is documented with a description and illustrations of the Red Sea specimen.

The following material was obtained through the courtesy of Dr. Gerhard Pretzmann from the Naturhistorisches Museum, Vienna, Austria: (1) One bottle, containing one vial with 3 males, with red label marked: "*Philomedes polae*, n. sp. ♂; Rotes Meer: Gulf von Suez;

Coll: 'Pola' 1895/8; Dr. Graf det." (2) One bottle with white label marked: "*Philomedes* sp. ♀; Rotes Meer: Stat. 90; Coll. 'Pola' 1895/8; Dr. Graf det." This bottle contained one vial with 2 females containing eggs that had not yet been extruded into the brood chamber and with a label that had been marked "*Philomedes* sp. ♀ (A)."

Since Dr. Graf had not designated a holotype of *Philomedes polae* Graf, Dr. Pretzmann suggested that I select a lectotype from the type material. Examining the material, I found 2 specimens in the first bottle that I could equate with *Philomedes polae* Graf, using primarily as a basis for identification the distinctive secondary appendage described and figured for this species by Graf (1931, p. 37, fig. 5i). The third specimen in the first bottle I identify as *Euphilomedes arostratus* Kornicker, recently described for the first time from the Maldive Islands, Indian Ocean.

The 2 specimens in the second bottle I equate to specimens described by Graf (1931) as *Philomedes* species on his page 38 and illustrated in his figure 6. The similarity of the distribution of primary and secondary claws on the caudal rami of the specimens at hand with the published description of *Philomedes* species makes it certain that this identification is correct. After studying these specimens, I have concluded that they are females of *Philomedes polae* Graf.

I acknowledge with thanks the assistance of Dr. Gerhard Pretzmann in obtaining specimens for study from the Naturhistorisches Museum, Vienna, Austria, and of Miss Caroline Bartlett, who inked the final illustrations. I would like also to thank Mr. I. G. Sohn and Doctors Raymond B. Manning and W. Duane Hope for reviewing the manuscript.

Family Cypridinidae Baird, 1850

Subfamily Philomedinae G. W. Müller, 1912

Genus *Euphilomedes* Poulsen, 1962

TYPE-SPECIES.—*Euphilomedes nodosus* Poulsen, 1962, by subsequent designation, Kornicker (1967).

Euphilomedes polae (Graf, 1931)

FIGURES 1–5

Philomedes polae Graf, 1931, p. 37, fig. 5.
Philomedes species.—Graf, 1931, p. 38, fig. 6.

LECTOTYPE.—Specimen designated as specimen B on slide. Naturhistorisches Museum, Zoologische Abteilung, Vienna, Austria.

SEX.—Male.

FIGURE 1.—*Euphilomedes polae*, male, specimen C (except *a* and *h*, spec. B): *a*, lateral view left valve showing some muscle scars, surface reticulation shown only near posteroventral margin of valve; *b*, lateral view anterior end of left valve showing surface and marginal hairs; *c*, lateral view anterior end of left valve showing flap over antennal sinus, and linear sclerotized area visible in transmitted light; *d*, lateral view posterior end of left valve showing surface hairs and some reticulations; *e*, medial view of part of shell posterior showing reticulations, normal pore canals and surface hairs; *f*, lateral view anterior end of right valve showing marginal denticulations around rostrum, flap over antennal sinus and linear sclerotized area; *g*, medial view anterior end of right valve; *h*, medial view anterior end of left valve; *i*, medial view of middle section of right valve showing adductor muscle scars below and dorsal muscle scars above; *j*, medial view of dorsal muscle scars below anterior hinge element and oval lucid area below muscle scars; *k*, medial view right valve showing minute reticulations within large reticulations on surface of valve. (Same scale, in microns: *b,c,d,f,i, e,g,h,j*.)

PARALECTOTYPE.—1 male designated as specimen C, Naturhistorisches Museum.

ADDITIONAL SPECIMENS.—2 females from the type-locality designated as specimens 1 and 2 on slides, Naturhistorisches Museum.

TYPE-LOCALITY.—Graf (1931) reported 4 specimens of *Philomedes polae* from *Pola* Expedition Station 90 and 1 specimen from Station 89; both stations are in the Gulf of Suez; all specimens are males. The vial containing specimens of *P. polae* did not bear a station number; however, as 3 specimens were in the vial, it is probable that all, and at least 2 of them, are from Station 90 rather than 89. Station 90, therefore, is considered here to be the type-locality; since Stations 89 and 90 are close to each other, however, whether the lectotype was collected at one or the other is not of major significance. Females of *P. polae*, designated by Graf as *Philomedes* species, were collected at Station 90. Data concerning the stations are as follows:

station	*latitude*	*longitude*	*collecting depth*	*date collected*
89	28°40′N	32°57′E	surface	March 31, 1896
90	28°00′N	33°36′E	surface	April 1, 1896

DESCRIPTION OF MALE.—Shell (figs. 1, 2*a–e*): oval, elongate with greatest height near middle, prominent rostrum and shallow rostral incisure (fig. 1*a*); anterior margin of rostrum and anteroventral margin of shell with scalloped outline formed by cresent-like marginal denticulations; alate shield projecting laterally and anteroventrally from behind rostral incisure, partly covering incisure, flap strongly sclerotized anteriorly (figs. 1*c,f*). Surface of valves with irregular polygons; polygons with pebbly texture appearing as minute polygons under high magnification (figs. 1*e,k*). Posterior dorsal margin with linear hinge depressed below outline of shell (figs. 2*b,c*); hinge not visible in lateral view except by transmitted light. Posterior hinge element of each valve consisting of angular sclerotized process (figs. 2*c,d*); medial hinge element straight; anterior hinge element not prominent. Left valve broadly overlapping right valve along anterodorsal margin. About 20 individual muscle scars (partly obscured by muscles in specimen examined) clustered behind and below middle of valve; small scar and large oval hyaline spot situated some distance above others; 2 large and 4 smaller scars situated below anterior hinge element (figs. 1*a,i,j*). Inner lamella broad with vestibule; no parallel striations or line of concrescence observed on inner lamella. Selvage with wide, corrugated, lamellar prolongation having fringe of slender spines along outer margin. Six long hairs bearing secondary spines, forming row on inner lamella behind rostrum (figs. 1*g,h*); inner lamella ventral to rostral incisure with small plumose hair, followed by wide space and then about 5 plumose hairs (fig. 2*a*); about 30 hairs on posteroventral part of inner lamella (figs. 2*d,e*).

FIGURE 2.—*Euphilomedes polae*, male, specimen B (except *c*, spec. C): *a*, medial view of anteroventral shell margin of left valve showing medial hairs; *b*, medial view of left valve hinge area (anterior on right); *c*, medial view of posterior hinge element on right valve; pustules along middle hinge element are dotted because they could not be seen with certainty on specimen C and were not observed on specimen B; *d*, medial view marginal area at posterior end of left valve showing medial hairs; *e*, medial view posteroventral and posterodorsal margin showing medial hairs; *f*, lateral view of right 1st antenna (only proximal part of c- and f-bristles shown); *g*, exopodite of 2nd antenna; *h*, distal end 3rd joint of endopodite of 2nd antenna; *i*, protopodite and endopodite of 2nd antenna; *j*, medial view 1st endopodite joint of left mandible, distal bristles are on ventral margin (joint foreshortened by oblique position of joint in mounting medium); *k*, medial view 2nd endopodite joint of left mandible, dorsal margin to right; *l*, lateral view end joint of right mandible, all bristles not shown. (Same scale, in microns: *a,b,e,f,g,i; c,d,j,k; h,l.*)

Hairs with either pointed or blunt ends distributed on rostral surface (fig. 1*b*), some forming row near margin of shell; slender hairs with pointed ends on posterior surface of shell, some forming row near posterior margin (fig. 1*d*); a long tapered hair projecting from base immediately behind posterior hinge element of each valve (figs. 2*c–e*); all hairs coming through normal pore canals; radial pore canals not observed.

Dimensions: Lectotype (specimen B) greatest length 1.12 mm, greatest height 0.63 mm; paralectotype (specimen C) greatest length 1.12 mm, greatest height 0.63 mm. Graf (1931, p. 38) gives length of this species as 1.05 mm and height 0.60 mm.

First antenna (fig. 2*f*): First joint with faint clusters of short hairs on medial surface. Second joint with clusters of long hairs on medial surface, and distally, a dorsal, ventral, and lateral bristle; all bristles bare or with short hairs, none with wreaths of long hairs. Third joint with a few clusters of short hairs on medial surface, and 1 ventral and 2 dorsal bristles, the longer dorsal bristle provided with wreaths of long hairs near middle and short hairs distally; other dorsal bristle and ventral bristle with short hairs. Fourth joint with 2 dorsal bristles, each with wreaths of long hairs and the more proximal bristle with short hairs distally, and 4 long ventral bristles subterminally, latter bristles bare or with short hairs distally. Fifth joint, inferred to be inserted ventrally between 4th and 6th joints, bearing sensory bristle with broad base and provided with numerous filaments. Sixth joint with single bristle on 1 limb and without bristle on other limb (bristle may have been broken off during dissection). End joints with 5 slender bristles and 2 long stout c- and f-bristles.

Second antenna (figs. 2*g-i*): Protopodite triangular with transparent rim (fig. 2*i*). Exopodite (fig. 2*g*): 1st joint elongate; 2nd joint about ⅓ length of 1st; 3rd joint about same length as 1st; distal margins of joints 2–8 with comb of short spines (not shown on fig. 2*g*); basal spines not observed. Bristle of 2nd joint about ½ length of 3rd joint, bearing short marginal spines. Bristles of joints 3–8 bearing natatory hairs, without marginal spines. End joint with 4 stout bristles with natatory hairs and 2 short slender bristles. Endopodite 3-jointed (figs. 2*h,i*); 1st joint with 5 bare short bristles and 1 long distal bristle with wreaths of long hairs near middle and short spines distally; 2nd joint elongate, with 2 subterminal bristles provided with short spines; 3rd joint elongate, broad proximally, with 1 short proximal bristle and 2 longer subterminal bristles; tip with short spine and about 5 serrate ridges.

Mandible (figs. 2*j–l*, 3*a, b*): No coxale endite observed. Basale (fig. 3*b*): ventral margin with 3 short slender spinous bristles, and 2

FIGURE 3.—*Euphilomedes polae*, male, specimen B: *a*, medial view of exopodite and 1st endopodite joint without distal bristles of left mandible; *b*, lateral view of basale and exopodite of right mandible; *c*, maxilla, all bristles not shown; *d*, 5th limb, hairs not shown on all epipodial bristles; *e*, endites and exopodite of 5th limb, all bristles not shown; *f*, 6th limb; *g*, 7th limb (1 bristle in distal group broken); *h*, distal end of 7th limb; *i*, frontal organ and median eye; *j*, lateral view of right furcal lamella; *k*, copulatory organ; *l*, detail of distal tip of copulatory organ; *m*, lateral eye. (Same scale, in microns: *a*, *e*, *h*, *l*; *b*, *f*, *i*, *m*; *c*, *g*; *d*, *j*, *k*.)

long bristles with wreaths of long hairs and short spines distally. Dorsal margin with 3 bristles, 1 near middle and 2 subterminally. Medial surface with about 5 short bristles proximally near ventral corner and 1 longer bristle near ventral margin at middle of joint. Exopodite reaching middle of 1st endopodite joint, with 2 subequal terminal bristles with short marginal spines (fig. 3*a*); tip of joint with blunt hirsute process bearing short spine. Endopodite: First joint (fig. 2*j*) with 1 short spinous bristle and 3 long hirsute posterior bristles distally. Second joint (fig. 2*k*) anterior margin with proximal group of 3 bristles and distal group of 5 bristles, all bristles bare or with short spines; posterior margin with 2 spinous bristles distal and 1 short annulated bristle and 2 clawlike bristles subterminally. End joint (fig. 2*l*) with 2 large subequal claws, 1 short anterior claw, and 3 annulated bristles. Medial surface of basale and 1st and 2nd joints of endopodite provided with groups of hairs.

Maxilla (fig. 3*c*): Very small. It seems to have a structure typical of the genus, but because of its size I have not attempted to describe it fully.

Fifth limb (figs. 3*d*, *e*): Epipodial appendage with about 47 plumose bristles. Outer lobe of 3rd exopodite joint with 2 stout plumose bristles.

Sixth limb (fig. 3*f*): First endite with 3 bristles, 2nd endite with 4 bristles, 3rd endite with 6 bristles, 4th endite with 6 bristles, 2nd joint of exopodite with 14 bristles, joint not produced posteriorly; epipodial appendage represented by 2 short bare bristles. Surface of second joint of exopodite with clusters of short hairs.

Seventh limb (figs. 3*g*, *h*): Cleaning bristles: 4 in distal group, each with 4 or 5 bells; 3 in proximal group, each with 1 to 3 bells; surface hairs not observed on bristles. Terminal comb with about 7 marginal teeth, some with marginal spines. Two long curved pegs opposing comb.

Copulatory organ (figs. 3*k*, *l*): Long, slender, divided into 3 lobes, each with 2 annulated bristles; 1 lobe with large curved sclerotized tip.

Furca (fig. 3*j*): Each lamella with 12 to 13 claws: primary claws number 1, 2, 6, 10; secondary claws 3, 4, 5, 7, 8, 9, 11, 12, 13 (13th claw not always present). Primary claws 1 and 2 separated from lamella, 6 and 10 joined to lamella; secondary claws all separated from lamella; all claws with double row of spines. Primary claws decrease in length proximally on lamella. Lamella near claws 1 and 2 with clusters of long hairs. (One specimen has 13 claws on each lamella, another specimen has 13 claws on the right lamella and only 12 on the left lamella.)

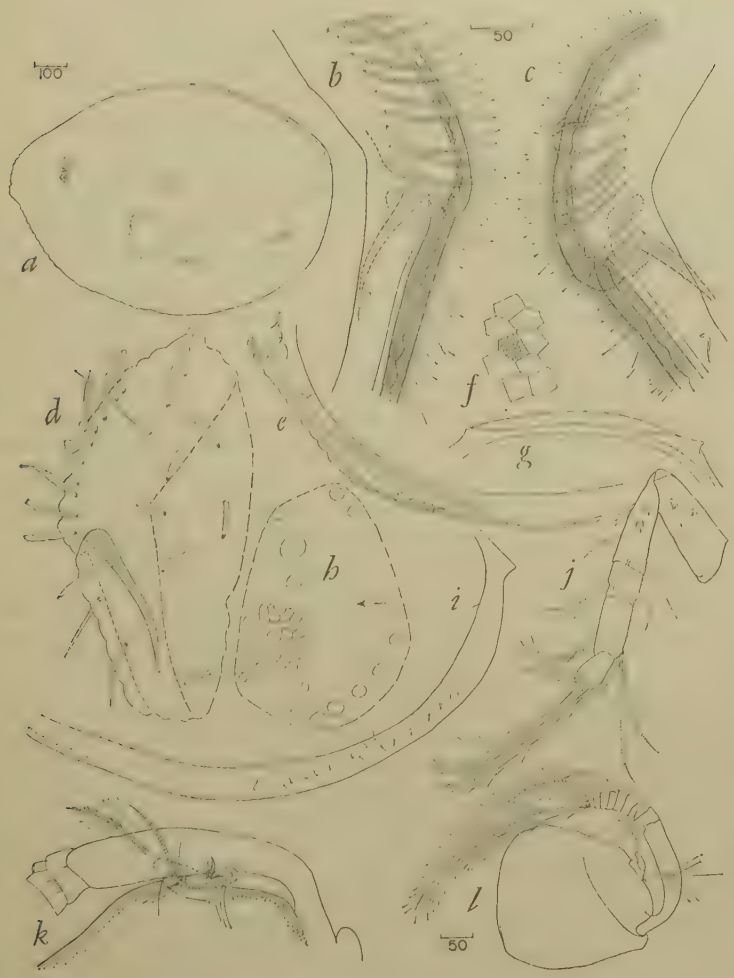

FIGURE 4.—*Euphilomedes polae*, female, specimen 2 (except *a–d*, *j–l*, spec. 1): *a*, lateral view left valve, dashed area near valve middle contains adductor muscle scars, not all surface polygons shown; *b*, medial view of anterior end of left valve, sclerotized areas stippled; *c*, medial view anterior of right valve, sclerotized areas stippled; *d*, lateral view of anterior end of left valve showing surface and marginal hairs; *e*, medial view of antero-ventral margin of right valve showing distribution of hairs on inner lamella; *f*, medial view of valve near posterior showing large and small reticulations; *g*, medial view hinge element of right valve (anterior end on right); *h*, medial view of muscle scars on right valves, adductor muscle scars clustered at lower left of figure, anterior of valve to left; *i*, medial view of posterior and ventral marginal area of right valve showing distribution of hairs on inner lamella; *j*, lateral view of left 1st antenna; *k*, lateral view of endopodite, first 3 joints of exopodite and distal margin of protopodite of left 2nd antenna; *l*, medial view of right 2nd antenna, ends of some bristles of exopodite not shown. (Same scale, in microns: *b–d*, *f*, *k*; *e*, *g–j*, *l*.)

Eyes: Lateral eyes large; about 19 ommatophores visible in side view, all except 2 divided by a suture into 2 parts (fig. 3*m*). Medial eye large, pigmented (fig. 3*i*).

Frontal organ (fig. 3*i*): Elongate, 2-jointed with short spines on distal half of 2nd joint and subterminally on basal joint.

Description of female.—Shell (figs. 4*a–i*): lateral outline more ovoid than male (fig. 4*a*); hinge structure (fig. 4*g*) selvage similar to male; adductor muscle scars (figs. 4*a,h*) more anteriorly and ventrally located on shell than on male; rostrum narrower and incisure shallower than on male; irregular polygons on surface of shell subdivided by minute polygons larger than on male shell and visible under low magnification (fig. 4*f*). Inner lamella with parallel striations on anteroventral part; 9 long hairs with secondary spines forming row on inner lamella behind rostrum (figs. 4*b,c*); inner lamella below rostral incisure with small hair followed by wide space and then 5 hairs (fig. 4*e*); posteroventral part of inner lamella with at least 21 hairs (fig. 4*i*); lateral surface of rostrum and anterior part of shell with numerous hairs with blunt ends (fig. 4*d*).

Dimensions: Specimen no. 1 greatest length 1.06 mm, greatest height 0.86 mm; specimen no. 2 greatest length 1.03 mm, greatest height 0.73 mm. Graf (1931, p. 38) gives length as 0.90 mm and 1.00 mm and height as 0.70 mm.

First antenna (fig. 4*j*): First and 2nd joints with surface hairs. Second joint with 3 bristles, 1 dorsal, 1 ventral, and 1 lateral. Third joint with 1 ventral bristle distally and 1 short bare bristle and 1 long hirsute bristle on dorsal margin; ventral margin with short spines. Fourth joint with 2 dorsal subterminal bristles and 1 short and 3 long ventral subterminal bristles; ventral margin with short spines. Fifth joint with stout ventral terminal bristle with filaments. Sixth joint with medial bristle distally. End joints with 1 short bristle and 2 long bristles without filaments and 4 long bristles with filaments.

Second antenna (figs. 4*k, l*): Protopodite subtriangular without transparent rim. Exopodite (fig.4*l*) with 9 joints; 1st joint elongate with small medial spine; 2nd to 9th joints trapezoidal without basal spines; distal margins of 2nd to 5th joints with comb of slender spines; 2nd and 3rd joints with bristles without natatory hairs or marginal denticulations; 4th to 8th joints with bristles having natatory hairs and marginal denticulations; 9th joint with 2 short bare bristles and 2 subequal long bristles with natatory hairs and marginal denticulations. Endopodite (figs. 4*k,l*) with 2 joints; basal joint with long stout bristle with wreath of long hairs near middle, and 3 to 5 short bare bristles; distal joint elongate with small spine at tip and long stout terminal bristle with wreaths of long hairs near middle and short distal spines.

FIGURE 5.—*Euphilomedes polae*, female, specimen 1: *a*, medial view right mandible (surface hairs not shown); *b*, lateral view left maxilla, all bristles not shown; *c*, posterior view left 5th limb; *d*, medial view right 6th limb; *e*, 7th limb; *f*, distal end of 7th limb; *g*, distal end frontal organ; *h*, frontal organ and medial eye; *i*, medial view right lamella of furca; *j*, lateral view left lamella of furca. (Same scale, in microns: *b,d,e,h–j; c,f,g*.)

Mandible (fig. 5*a*): Coxale endite large, bifurcate, with rows of spines. Basale: ventral margin with 4 short bristles followed by 1 longer bristle near distal end; dorsal margin with 3 bristles, 1 near middle and 2 at distal end; medial surface with 1 bristle at middle and 5 shorter bristles proximally, all near ventral margin. Exopodite short with 2 bristles and triangular process at tip, inner bristle with wreath of long hairs near middle. Endopodite: distal end of 1st joint with 1 short and 3 long bristles ventrally; anterior margin of 2nd joint with proximal group of 4 and distal group of 5 bristles; posterior margin with 2 subterminal bristles and terminally with 1 short annulate bristle and 2 clawlike bristles; distal joint with 2 long stout claws of subequal length and 3 bristles. Surface of basale and 2nd joint of exopodite hirsute.

Maxilla (fig. 5*b*): Precoxa and coxa with fringe of fine hair along dorsal margin; coxa with short bare bristle on dorsal margin; basale with 3 distal bristles; 1st endopodite joint with marginal hairs, a hirsute bristle terminal on anterior margin and about 5 bristles on distal margin; distal end of endopodite joint provided with numerous bristles; exopodite with 2 long and 1 short bristle. Three endites: 1st endite with about 8 bristles; 2nd endite with about 4 bristles; 3rd endite with about 6 distal and 1 proximal bristle (bristles not shown in illustration).

Fifth limb (fig. 5*c*): Epipodial appendage with about 49 bristles. Triangular tooth anterior to main tooth of 1st exopodite joint about same size as distal tip of 2nd exopodite joint. Distal anterior margin of 1st joint with 2 centrally located bristles. Large curved tooth of 2nd exopodite joint without bristle at distal lateral corner.

Sixth limb (fig. 5*d*): First endite with 3 bristles; 2nd endite with 4 bristles; 3rd endite with 7 bristles; 4th endite with 6 bristles; epipodial appendage represented by 2 short bristles. Second joint of exopodite not produced posteriorly, distal margin with 13 to 14 bristles, medial and lateral surfaces hirsute.

Seventh limb (figs. 5*e,f*): Five cleaning bristles in distal group, 3 in proximal group, each bristle with 1 to 5 terminal bells. Terminal comb with about 9 teeth, secondary teeth at base (all teeth not shown in illustration); 2 elongate pegs opposing comb.

Furca (figs. 5*i,j*): Each lamella with 4 primary claws and 10 to 12 secondary claws. Primary claws 1 and 2 separated from lamella, 7 and 12 (or 11) joined to lamella. Primary claws decrease in length proximally on lamella. Secondary claws 3 to 6 about same length, shorter than claw 7, longer than claw 8; claws 8 to 12 (or 11) decrease in size proximally. Primary claw 12 (or 11) about same size or longer than preceding secondary claw and longer than following secondary

claw. Lamella near basis of claws with long hairs. Primary claws 1 and 2 with double row of teeth, claws 7 and 12 without teeth; secondary claws with marginal spines. Distribution of primary and secondary furcal claws on 2 specimens is as follows:

	claw number															
	1	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*	*12*	*13*	*14*	*15*	*16*
specimen 1																
right	p	p	s	s	s	s	p	s	s	s	s	p	s	s	s	s
left	p	p	s	s	s	s	p	s	s	s	p	s	s	s		
specimen 2																
right	p	p	s	s	s	s	p	s	s	s	s	p	s	s	s	
left	p	p	s	s	s	s	p	s	s	s	s	p	s	s		

Eyes: Large medial eye (fig. 5*h*); lateral eyes not observed.

Frontal organ (figs. 5*g*,*h*): 2-jointed with distal joint 3 times length of proximal joint; tip rounded; surface of 2nd joint and distal end of 1st joint with fine spines.

Remarks.—Extreme sexual dimorphism among some species of ostracods creates inherent difficulties in relating males and females with certainty. Carapace morphology in the region of the rostrum and rostral incisure between males and females of *Euphilomedes polae* identified herein is sufficiently similar to warrant considering them as conspecific in spite of some differences in appendage morphology. Both males and females were collected in the same area. The male and female of *E. arostratus* Kornicker, a closely related species, have similar dimorphism.

Some differences in morphology between males and females of *E. polae* and *E. arostratus* are compared as follows:

	E. polae		*E. arostratus*	
	male	female	male	female
number of secondary furcal claws	8–9	10–12	7	9
cleaning bristles in distal group of 7th limb	4	5	4	5
number of hairs in row on inner lamella behind rostrum	6	9	9–11*	11

*The male of *E. arostratus* described from the Maldive Islands (Kornicker, 1967) has 9 to 10 hairs, whereas the Red Sea form described in this paper has 11.

Comparisons.—*Euphilomedes polae* is closely related to *E. arostratus* Kornicker but may be differentiated from that species by the shallower rostral incisure with a lateral shield, the subterminal location of bristles on the 2nd joint of the endopodite of the 2nd antenna of the male, and the lower number of bristles on the anteroventral part of the inner lamella of the carapace: 5 compared to 16–21 on *E. arostratus*.

Euphilomedes arostratus Kornicker, 1967

FIGURE 6

Euphilomedes arostrata Kornicker, 1967, p. 2.

HOLOTYPE.—USNM 112658. Sex: female. Male Atoll, Maldive Islands, Indian Ocean.

LOCALITY.—Gulf of Suez, Red Sea. Specimen probably from Station 90 but could be from Station 89. Data concerning the stations is given under "Type-locality" of *E. polae*. This specimen was in vial containing specimens identified as *Philomedes polae* by Dr. Herbert Graf.

DESCRIPTION OF MALE.—Shell (figs. 6*a–e, h*): oval, elongate with greatest height near middle, prominent rostrum and antennal sinus (figs. 6*a, b, e*); anterior margin of rostrum and anteroventral margin of shell with scalloped outline formed by crescent-like marginal denticulations. Surface of valves with distinct irregular polygons (fig. 6*h*); polygons with pebbly texture appearing as minute polygons under high magnification. Posterior dorsal margin with linear hinge depressed below outline of shell; posterior hinge element of each valve consisting of angular sclerotized process; medial hinge element straight; anterior hinge element not prominent. Left valve broadly overlapping right valve along anterodorsal margin. Numerous adductor muscle scars (partly obscured by muscles in specimen examined) clustered behind and below middle of valve; 2 small scars and large oval hyaline spot situated some distance above other; additional scars below anterior hinge element (fig. 6*h*). Inner lamella broad with vestibule; selvage with wide, corrugated lamellar prolongation having fringe of slender spines along outer margin. Eleven long hairs with a few secondary spines forming row on inner lamella behind rostrum (fig. 6*b*); inner lamella below rostrum with small hair followed by wide space and then 20 hairs on right valve and 21 on left valve (figs. 6*c, d*); about 34 hairs on posteroventral part of inner lamella. Hair with either pointed or blunt ends distributed on rostral surface, some forming row near margin of shell; slender hairs with pointed ends on posterior surface of shell, some forming row near posterior margin; a long tapered hair projecting from base immediately behind posterior hinge element of each valve.

Dimensions: Greatest length 1.23 mm, greatest height 0.73 mm. Specimen is larger than male reported by Kornicker (1967) from the Maldives, length 1.00 mm, height 0.60 mm.

First antenna: First joint with medial hairs. Second joint with medial hairs and, distally, a dorsal, ventral, and lateral bristle, all bristles bare or with short hairs distally. Third joint with few medial hairs and 1 ventral and 2 dorsal bristles, all with short hairs, the

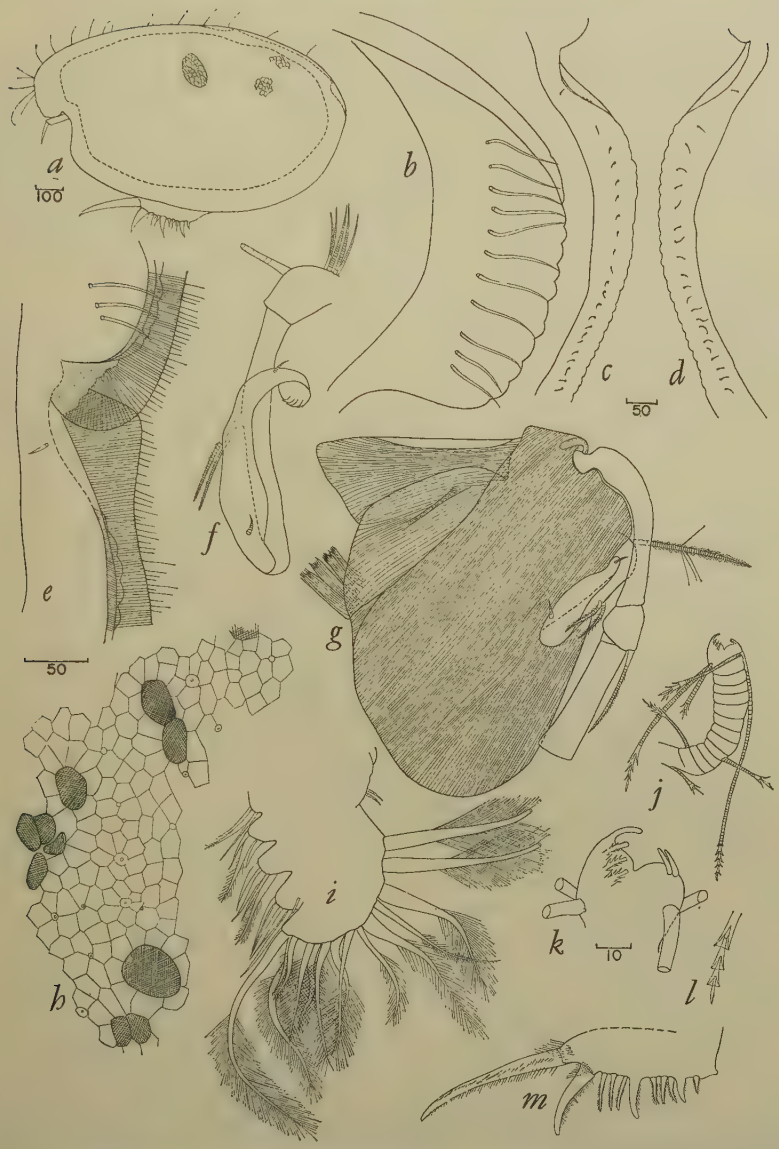

FIGURE 6.—*Euphilomedes arostratus*, male, specimen A: *a*, lateral view of complete carapace showing position of lateral eye and some reticulations; *b*, medial view rostrum left valve; *c*, medial view of anteroventral margin of left valve; *d*, medial view of anteroventral of margin of right valve; *e*, medial view of antennal sinus area of left valve; *f*, endopodite of left 2nd antenna; *g*, lateral view protopodite, endopodite, and 1st 3 joints of exopodite of 2nd antenna; *h*, medial view of reticulations, normal pores, and muscle scars (cross-hatched) located dorsal to adductor muscle scars on left valve, anterior to right, upper scars are located below anterior hinge element; *i*, medial view right 6th limb (surface hairs not shown); *j*, distal part of 7th limb; *k*, distal tip of 7th limb; *l*, detail of distal end of bristle of 7th limb; *m*, lateral view left caudal lamella. (Same scale, in microns: *b,e,f,h–j; c,d,g,m; k,l.*)

longer dorsal bristle also provided with wreaths of long hairs near middle. Fourth joint with 2 dorsal bristles, each with wreaths of long hairs, and 4 long ventral bristles subdistally; bristles bare or with short hairs distally. Fifth joint, inferred to be inserted ventrally between 4th and 6th joints, bearing sensory bristle with broad base and numerous filaments. Sixth joint with single dorsal bristle distally having short spines. End joint with 1 short dorsal bristle with short spines, 2 slender bristles with filaments, 2 bristles with filaments, and usual long, stout c- and f-bristles.

Second antenna (figs. 6*f*,*g*): Protopodite triangular without transparent rim (fig. 6*g*). Exopodite: first joint elongate; 2nd joint about ¼ length of 1st; 3rd joint about ⅔ length of 1st; distal margins of joints 2–8 with comb of short spines; basal spines not observed. First joint without bristle; bristle of 2nd joint about ¾ length of 3rd joint (fig. 6*g*), bearing short marginal spines. Bristles of joints 3–8 bearing natatory hairs, without marginal spines. End joint with 4 stout bristles with natatory hairs and 2 short slender bristles without hairs. Endopodite (fig. 6*f*) 3-jointed; 1st joint with 5 bare short bristles and 1 long distal bristle with wreaths of long hairs near middle and short spines distally; 2nd joint elongate, with 2 bristles near middle, bristles provided with short spines; 3rd elongate with 1 proximal and 1 distal short bristle, tip with serrated ridges (tip of appendage partly obscured with the result that presence or absence of spine at tip could not be ascertained).

Mandible: No coxale endite observed. Basale: ventral margin with 4 short slender bristles and 2 long bristles with wreaths of long hairs and short spines distally. Dorsal margin with 3 bristles. Medial surface with about 5 short bristles proximally near ventral corner and 1 longer bristle near ventral margin at middle of joint. Exopodite reaching middle of 1st endopodite joint, with 2 subequal terminal bristles; tip of joint with blunt hirsute process. Endopodite: first joint with 1 short and 3 long ventral bristles distally. Second joint of anterior margin with proximal group of 3 and distal group of 5 bristles; posterior margin with 2 distal spinous bristles and 1 short annulated bristle and 2 clawlike subterminal bristles. End joint with 2 large subequal claws, 1 short posterior claw, and 3 annulated bristles. Medial surface of basale and 1st and 2nd joints of endopodite provided with groups of hairs.

Maxilla: Very small. It seems to have a structure typical of the genus, but because of its small size I have not attempted to describe it fully.

Fifth limb: Epipodial appendage with 45 plumose bristles. Outer lobe of 3rd exopodite joint with 2 stout plumose bristles.

Sixth limb (fig. 6*i*): First endite with 3 bristles, 2nd endite with 4 bristles, 3rd endite with 7 bristles; 2nd joint of exopodite with 14 or 15 bristles, joint not produced posteriorly; epipodial appendage represented by 2 short bare bristles. Surface of 2nd joint of exopodite with clusters of short hairs (not shown on illustration).

Seventh limb (figs. 6*j–l*): Cleaning bristles: 4 in distal group, each with 2 to 4 bells; 3 proximal bristles, each with 1 to 3 bells; some bristles with short marginal spines. Terminal comb with about 7 marginal teeth, some with spines. Two long curved pegs opposing comb.

Copulatory organ: Long slender, divided into 3 lobes with bristles.

Furca (fig. 6*m*): Each lamella with 11 claws: primary claws number 1, 2, 6, 10; secondary claws 3, 4, 5, 7, 8, 9, 11. Primary claws 1 and 2 and all secondary claws separated from lamella; all claws with double row of spines. Primary claws decrease in length proximally on lamella. Lamella near claws 1 and 2 with clusters of long hairs.

Frontal organ: Elongate, 2-jointed with short spines on surface of end joint and distal end of basal joint.

Remarks.—Although I have identified the Red Sea specimen as *Euphilomedes arostratus*, some differences between this form and that described from the Maldive Islands (Kornicker, 1967) creates doubt concerning their conspecificity. A difference of possible significance is that the Red Sea form has 2 bristles in place of the epipodial appendage on the 6th limb as contrasted to 3 in this position on the male of *E. arostratus* described from the Maldives. The female of *E. arostratus* from the Maldives, however, has only 2 bristles, suggesting that the species may have either 2 or 3 epipodial bristles. Also, whereas the male of *E. arostratus* from the Maldives has 9 to 10 bristles on the inner lamella behind the rostrum, the Red Sea form has 11, the same number as the female from the Maldives. This suggests that the number of bristles in this position might vary from 9 to 11 for the species. The Red Sea specimen is also larger than the Maldive form. In most characters, the Red Sea and Maldive Island forms are so similar that it seems best at this time to include them in the same species.

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